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(56) Documents Cited

GB 2279242 A GB 2274979 A WO 91/05672 A

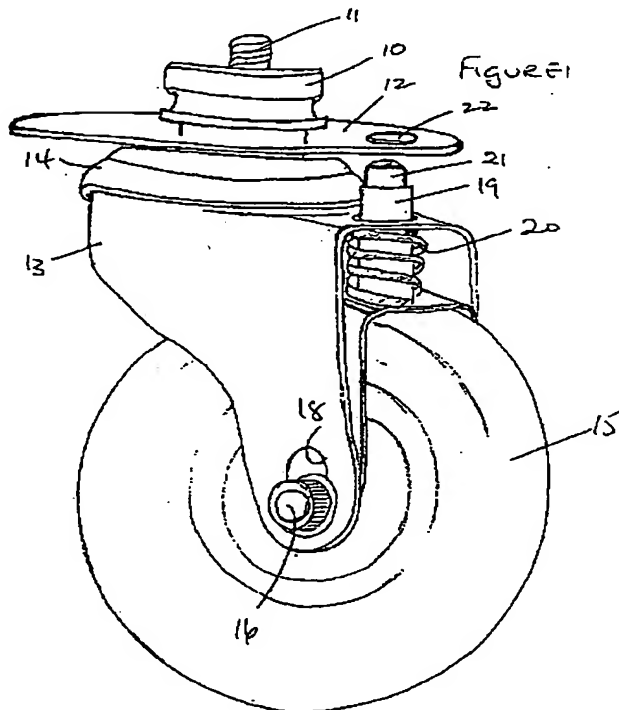
(58) Field of Search

UK CL (Edition S) A4L LDF
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(54) Abstract Title

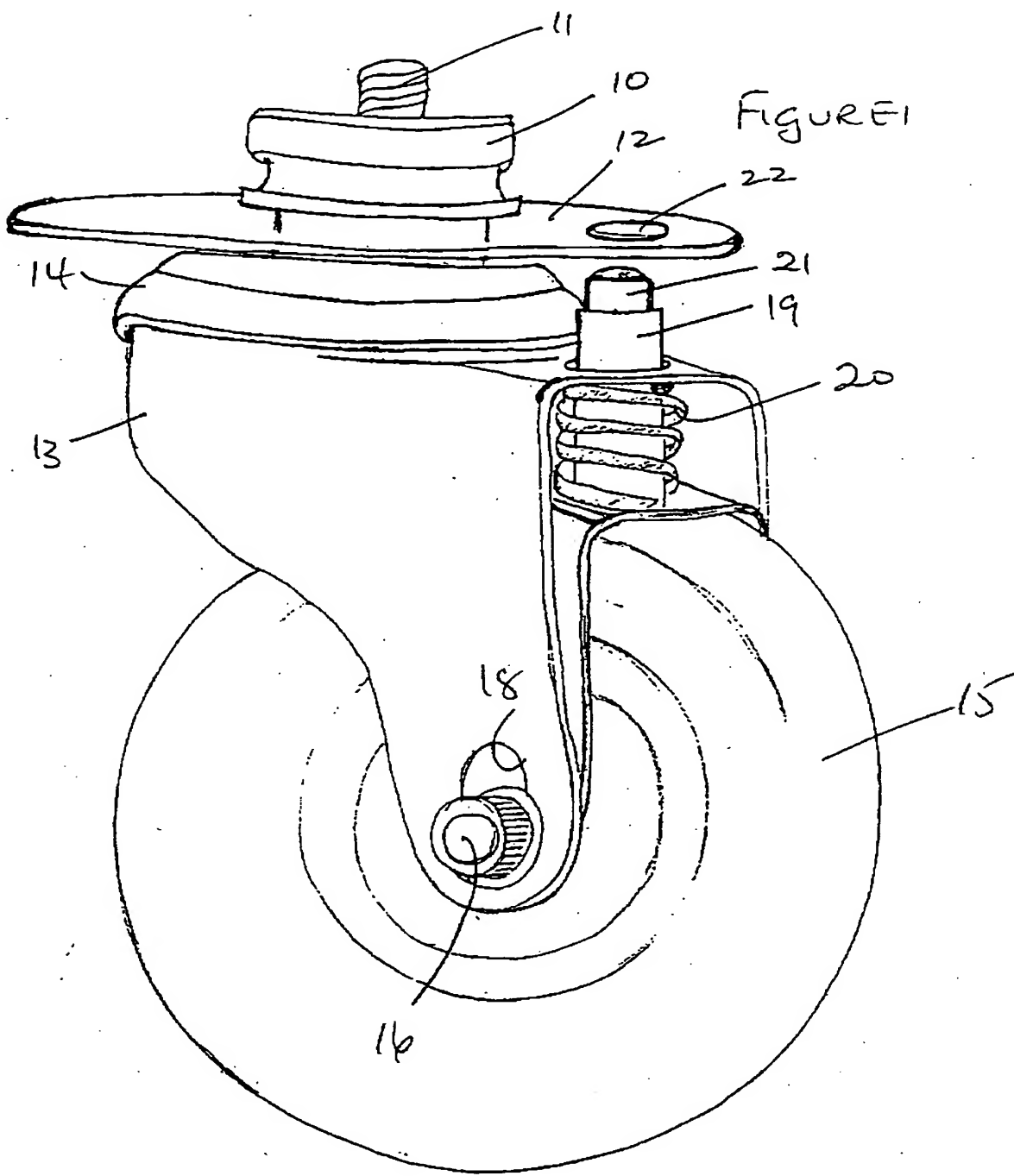
Swivel castor with load dependent locking element

(57) A swivel castor for a supermarket trolley includes a locking element (21) movable into engagement with a co-operating locking formation (22) such that, when the locking element (21) is in engagement with the co-operating locking formation (22), swivelling movement of the castor is prevented, spring means (20) urging the locking element (21) out of engagement with the co-operating locking formation (22) and load-applying means (10, 11) such that the application of a load to the castor acts in opposition to the action of the spring means (20). A load carrying structure such as a trolley fitted with the castors is also claimed.



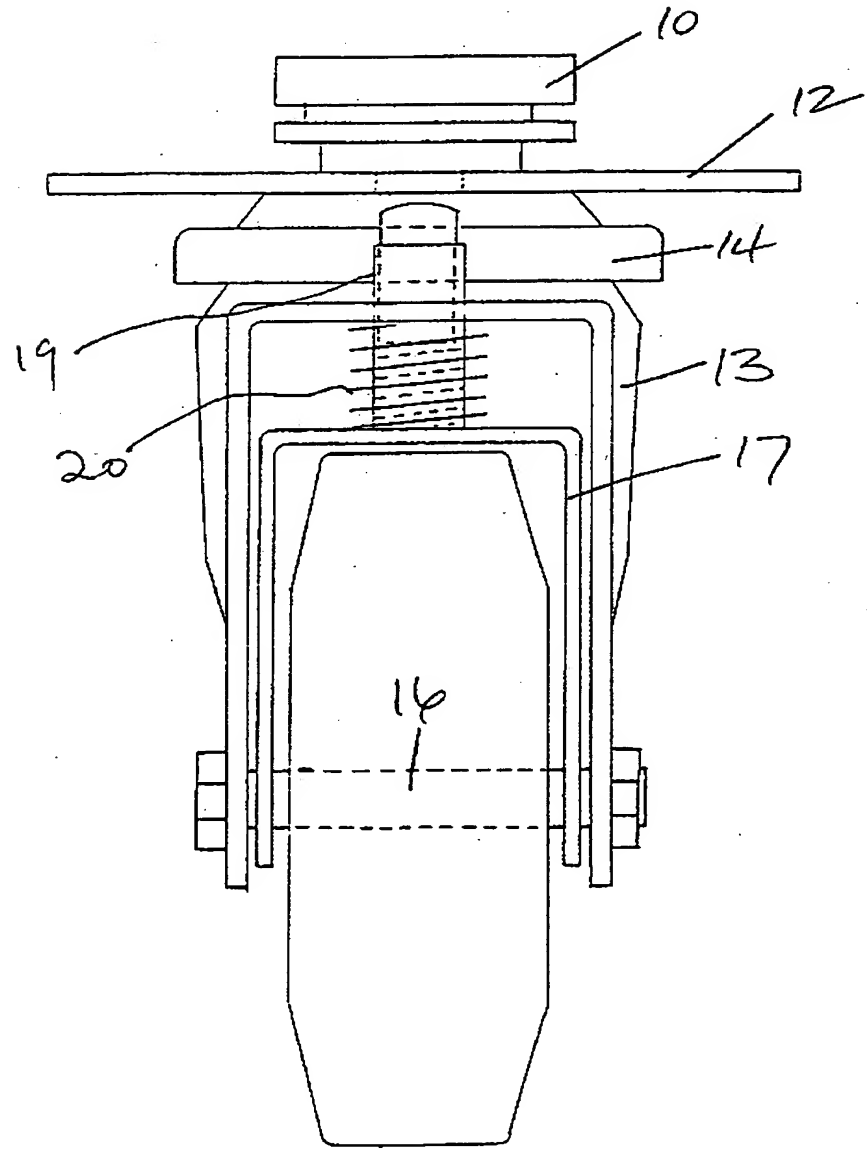
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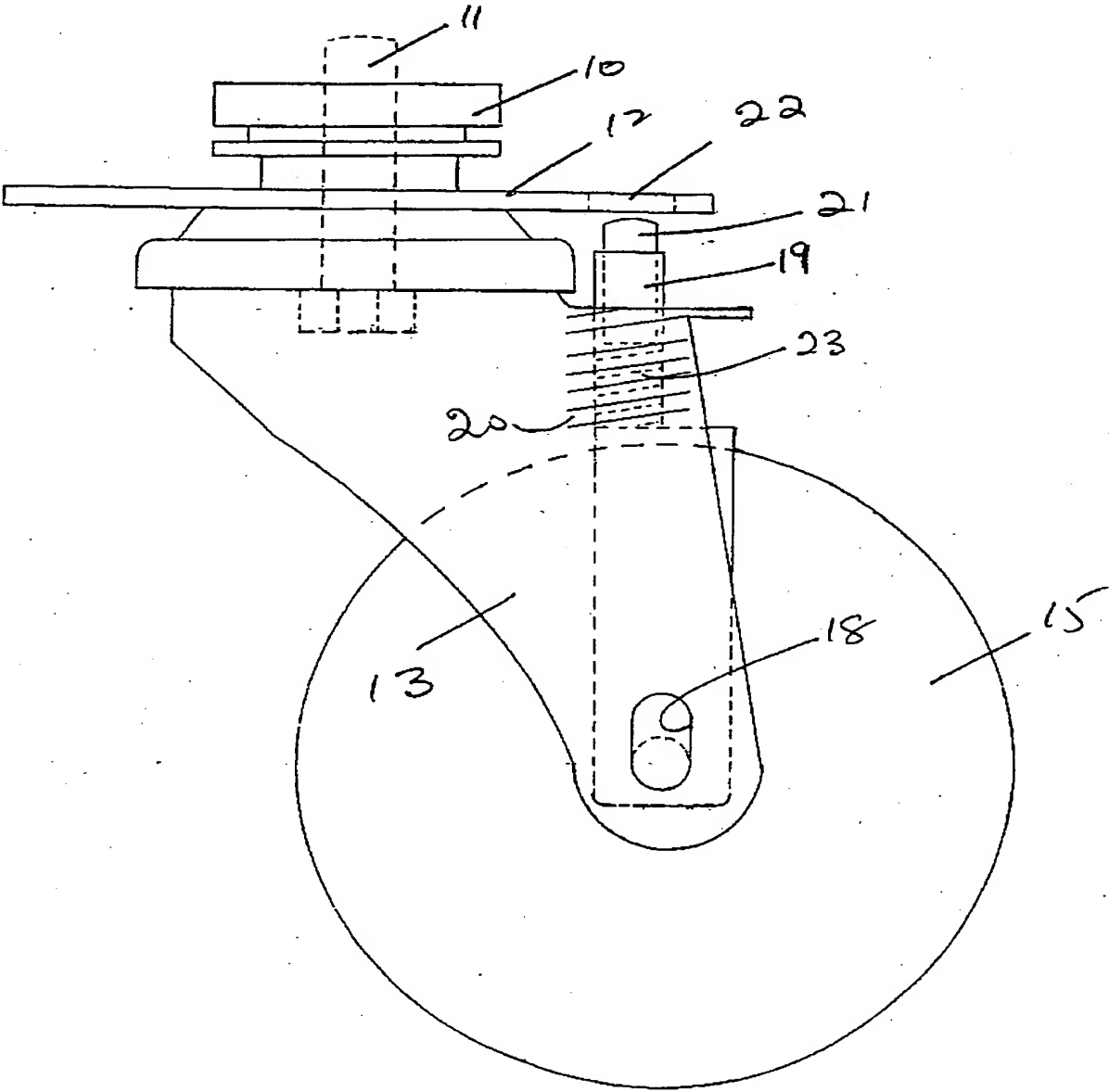
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Figure 2



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Figure 3



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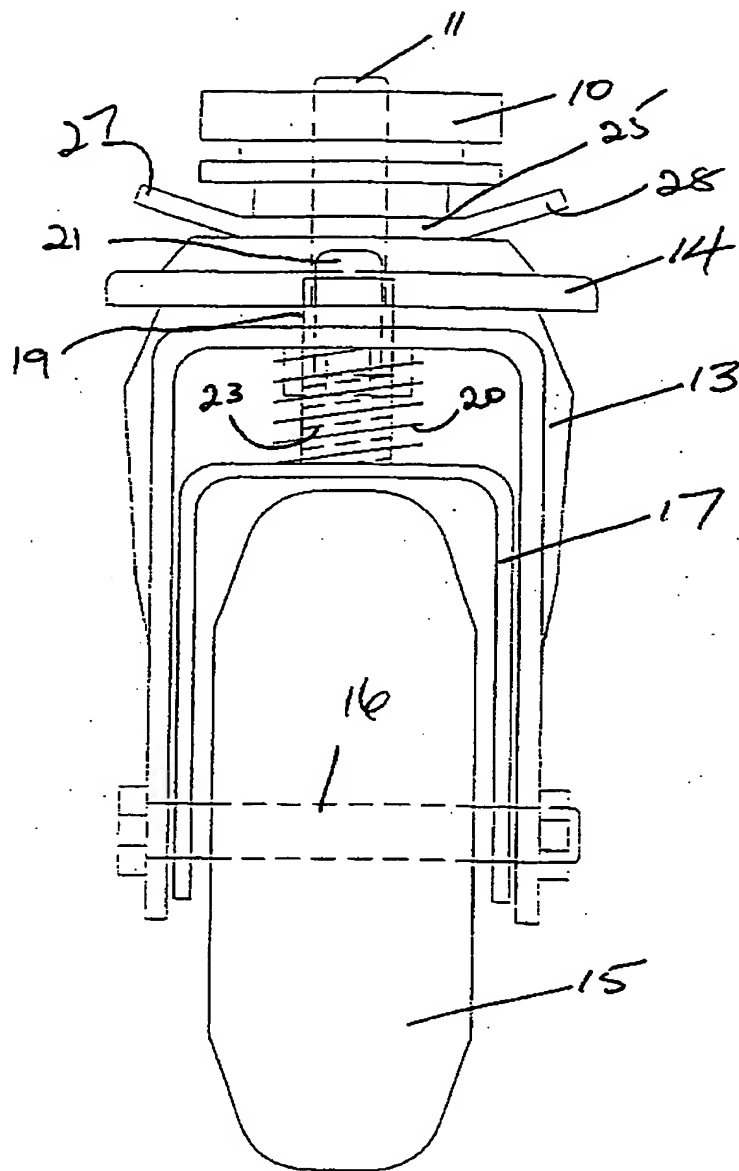
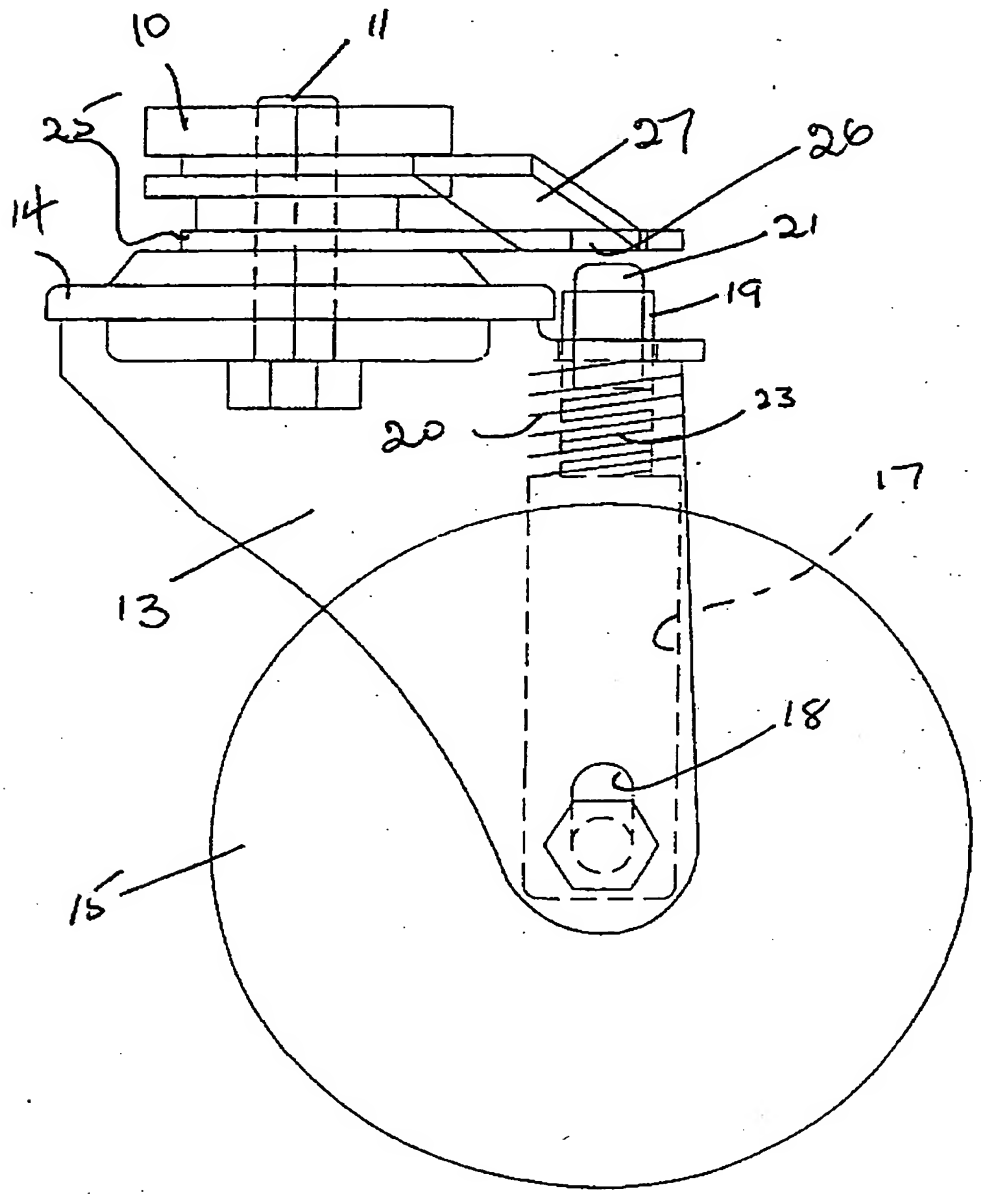


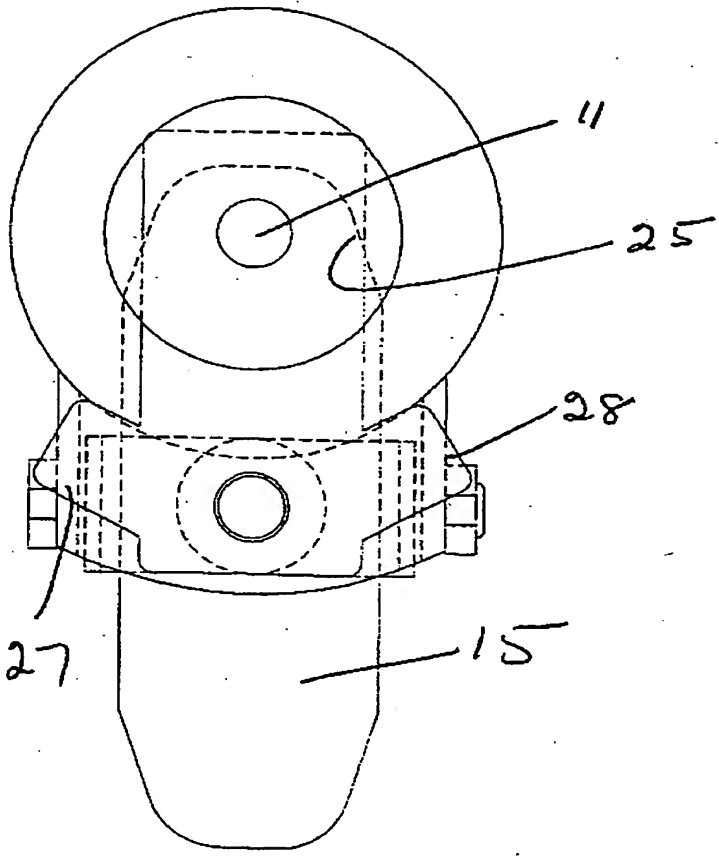
FIGURE
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FIGURE 5



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FIGURE 6



2361179**CASTORS AND SUPERMARKET TROLLEYS****Field of the Invention**

This invention relates to castors, particularly castors for supermarket trolleys, and to supermarket trolleys fitted with such castors.

Supermarket trolleys often have four castor wheels, each of which has a swivel mounting so that the trolley can be moved in any direction as the shopper makes his or her journey up and down the aisles of the supermarket.

Such freedom to move in any direction is of advantage while travelling around the supermarket, but it does create steering problems and almost everyone will have either pushed or seen a supermarket trolley which seems to have its own mind and objects to travelling in a straight line, particularly over the supermarket car park.

It is accordingly an object of the present invention to provide an improved design of castor which is particularly suitable for use on a supermarket trolley but could also be used on, for example, an airport trolley or on a hospital bed.

Summary of the Invention

According to a first aspect of the present invention there is provided a swivel castor which includes a locking element movable into engagement with a co-operating locking formation such that, when the locking element is in engagement with the co-operating locking formation, swivelling movement of the castor is prevented, spring means urging the locking element out of engagement with the co-operating locking formation and load-applying means such that the application of a load to the castor acts in opposition to the action of the spring means.

The arrangement is thus such that, when the castor is fitted to a supermarket trolley and the trolley is empty, the locking element will be maintained out of engagement with the co-operating locking formation whereas, when the trolley contains a predetermined load, the locking element will be movable into engagement with the co-operating locking formation.

The swivel castor preferably includes a wheel and a swivel wheel housing arranged for swivelling movement about a vertical axis when secured to a supermarket trolley, and the locking element is conveniently a locking pin movable relative to a guide formation secured to a suspension fork which is movable vertically relative to the swivel wheel housing.

The castor wheel is thus preferably rotatable about the axis of a pivot pin fixed to the suspension fork and the swivel wheel housing preferably includes vertical slots within which the pivot pin is movable. The spring means preferably includes a spring which acts between a part of the suspension fork and a part of the swivel wheel housing to urge the swivel wheel housing upwardly relative to the suspension fork.

The co-operating locking formation which is engageable by the locking pin may comprise an aperture or recess formed in a locking plate fixed to or forming part of the means for mounting the swivel housing on the trolley.

According to a second aspect of the present invention there is provided a load-carrying structure fitted with a plurality of castors some of which are swivel castors as defined above.

The load-carrying structure is preferably a trolley, e.g. a supermarket trolley or an airport trolley, but could alternatively be a hospital bed with the arrangement such that, when the bed is empty, the locking element of each swivel castor is out of engagement with the co-operating locking formation and swivelling movement of each castor is permitted whereas, when the bed is occupied, swivelling movement of each swivel castor is prevented.

Brief Description of the Drawings

Figure 1 is a perspective view of a first form of swivel castor,

Figure 2 is a front view of the swivel castor of Figure 1,

Figure 3 is a side view of the swivel castor of Figure 1,

Figure 4 is a front view of a second form of swivel castor,

Figure 5 is a side view of the swivel castor of Figure 4, and

Figure 6 is a plan view of the swivel castor of Figure 4.

Description of the Preferred Embodiments

The swivel castor shown in Figures 1 to 3 includes a fitment 10 for connection, by means of a bolt 11, to a supermarket trolley (not shown). A locking plate 12 is connected to the fitment 10 and is fixed against movement relative to the trolley.

A swivel wheel housing 13 includes a bearing assembly 14 such that the housing 13 is free to rotate about a vertical axis relative to the trolley, which axis coincides with that of the bolt 11. The castor wheel 15 is mounted on a pivot pin 16 which is fixed to the two arms of a suspension fork 17. The two arms of the suspension fork 17 are contained within the side members of the swivel wheel housing 13 and these side members are formed with vertical slots 18 to receive the pivot pin 16.

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The suspension fork 17 includes a bridging piece to which is attached a cylindrical element 19 and the swivel housing 13 includes a bridge piece which is formed with a circular aperture through which the cylindrical element 19 projects. A helical compression spring 20 surrounds the cylindrical element 19 and acts between the bridge piece of the suspension fork 17 and the bridge piece of the swivel housing 13 to urge the swivel housing 13 (and thus the supermarket trolley to which it is fitted) upwardly relative to the axis of the castor wheel 13.

The cylindrical element 19 acts as a guide for a locking pin 21 having a rounded upper end and the locking pin 21 is arranged to fit in an aperture 22 in the locking plate 12. When the locking pin 21 engages in the aperture 22, the swivel housing 13 is prevented from movement about its vertical swivel axis relative to the fitment 10. The locking pin 21 is urged resiliently out of the cylindrical element 19 by means of a relatively light rate spring 23 contained within the cylindrical element 19.

Two swivel castors as described above will normally be fitted on either the front or the rear of a supermarket trolley and two standard swivel castors will be fitted on the other end of the trolley. When the trolley is empty, the swivel housing 13 will be urged upwardly relative to the suspension fork 17 and the components of the castor will be in the relative positions shown in Figures 1 to 3, in which the pivot pin 16 is at the lower ends of the slots 18 and the upper end of the locking pin 21 is spaced downwardly from the locking plate 12.

When, however, the trolley is progressively filled with goods, the load applied to the swivel wheel housing 13 will effect corresponding compression of the spring 20 and the swivel wheel housing 13 will move downwardly relative to the suspension fork 17, i.e. the locking plate 12 will move downwardly relative to the locking pin 21. A position will accordingly be reached in which the upper end of the locking pin 21 is at a higher level than the lower surface of the locking plate 12. When the trolley is then moved forwardly and the castor swivels into its straight-ahead position, the locking pin 21 will enter the aperture 22 and further swivelling of the castor will be prevented.

As shown in Figure 1, the locking plate 12 is of substantially circular form in plan view and the arrangement is such that, if the load in the trolley is increased when the castor is not in its straight-ahead position, the upper end of the locking pin 21 will contact the lower surface of the locking plate 12 and will be moved downwardly into the cylindrical element 19 against the action of the spring 23. The locking pin 21 will then remain in its downwardly depressed condition until the castor is swivelled into its straight-ahead position and the locking pin 21 is brought into alignment with the aperture 22, whereupon it will move upwardly under the action of the spring 23.

The swivel castor shown in Figures 4 to 6 has a majority of components which are the same as the corresponding components of the swivel castor of Figures 1 to 3 and are indicated by the same

reference numerals in the drawings. The swivel castor of Figures 4 to 6 includes an alternative form of locking plate 25 for use in place of the locking plate 12. The alternative locking plate 25 is fixed to the mounting 10 so that it does not move relative to the supermarket trolley and it has a first aperture through which passes the shank of the fixing bolt 11. The plate 25 also has a second aperture 26 which is the locking aperture and is arranged to receive the upper end of the locking pin 21 when the castor is locked against swivelling movement relative to the trolley. As shown, the plate 25 is of generally rectangular form but with a pair of projecting wings 27 and 28 located one on each side of the locking aperture 26. The wings 27 and 28 are inclined to the horizontal so that the lower surfaces thereof serve as ramps effecting gradual compression of the spring 23 as the castor is swivelled into its straight-ahead position. The inclined wings 27 and 28 thus provide a lead-in facilitating engagement of the upper end of the locking pin 21 in the locking aperture 26.

If desired, a catch may be provided to disable the locking action. For example, the catch may comprise a blocking element which limits the distance of travel of the swivel wheel housing 13 relative to the suspension fork 17 and thereby prevents engagement of the locking pin 21 with the locking plate 12.

Claims:-

1. A swivel castor which includes a locking element movable into engagement with a co-operating locking formation such that, when the locking element is in engagement with the co-operating locking formation, swivelling movement of the castor is prevented, spring means urging the locking element out of engagement with the co-operating locking formation and load-applying means such that the application of a load to the castor acts in opposition to the action of the spring means.

2. A swivel castor as claimed in Claim 1, which includes a wheel and a swivel wheel housing arranged for swivelling movement about a vertical axis when secured to a supermarket trolley.

3. A swivel castor as claimed in Claim 2, in which the locking element is a locking pin movable relative to a guide formation secured to a suspension fork which is movable vertically relative to the swivel wheel housing.

4. A swivel castor as claimed in Claim 3, in which the castor wheel is rotatable about the axis of a pivot pin fixed to the suspension fork.

5. A swivel castor as claimed in Claim 4, in which the swivel wheel housing includes vertical slots within which the pivot pin is movable.

6. A swivel castor as claimed in Claim 5, in which the spring means includes a spring which acts between a part of the suspension fork and a part of the swivel wheel housing to urge the swivel wheel housing upwardly relative to the suspension fork.

7. A swivel castor as claimed in Claim 6, in which the co-operating locking formation which is engageable by the locking pin comprises an aperture or recess formed in a locking plate fixed to or forming part of the means for mounting the swivel housing on the trolley.

8. A swivel castor substantially as hereinbefore described with reference to and as shown in Figures 1 to 3 of the accompanying drawings.

9. A swivel castor substantially as hereinbefore described with reference to and as shown in Figures 4 to 6 of the accompanying drawings.

10. A load-carrying structure fitted with a plurality of castors some of which are swivel castors as claimed in any one of the preceding claims.



INVESTOR IN PEOPLE

Application No: GB 0108908.5
 Claims searched: 1 to 10

Examiner: Matthew Clarke
 Date of search: 25 June 2001

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.S): A4L (LDF)

Int Cl (Ed.7): B60B (33/00, 33/02, 33/06)

Other: Online: WPI, EPODOC, PAJ

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2279242 A (WATTS) see whole document, especially page 2 lines 3-21	1-6, 10
X	GB 2274979 A (CARSON) see whole document, especially page 3 line 14 to page 5 line 1	1, 2, 10
X	WO 91/05672 (LOVIE) see whole document, especially page 4 line 26 to page 5 line 4	1-7, 10

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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